CYBER SECURITY 2010

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Contingency Planning

Peter Sommer

London School of Economics, Open University

peter@pmsommer.com

p.m.sommer@lse.ac.uk

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Assumptions

- Your detective and preventative measures have failed - the cyber event has started and you need to mitigate and recover
- Why?
  - ➔ Zero day exploits
  - ➔ Your system is being overloaded because of problems elsewhere
  - ➔ You are under attack, but can't retaliate because you lack sufficient attribution of the source

A Contingency Plan may be your best defence against Cyber Attack

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Experience of Contingency Planning

- **Knowledge and experience exists in the commercial sector**
  - ➔ **Sub-industry of specialist stand-by facilities**
  - ➔ **Skills in detailed planning and testing**
- **Some Governments have significant Civil Contingencies experience**
  - ➔ **Bombs, Floods, Escape of Noxious substances, Pandemics, Industrial Unrest, Earthquakes, etc**
- **How far does this extend to the Cyber Domain?**

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Basics of Disaster Recovery

The chances of being hit have almost nothing to do with the chances of successful recovery

You need to understand what recovery looks like – and how it takes place

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Disaster Recovery

The chances of being hit:

- Logical / Cyber attack
- Bomb, kinetic attack
- Fire
- Flood
- Electrical outage
- Computer failure – hardware, software
- Telecoms failure

➢ Preventative / Detective Measures

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Disaster Recovery

The chances of successful recovery (commercial businesses):

- **Cash flow / overheads / indebtedness**
- **Business organisation**
- **Perishability of products / services**
- **Single site / multiple site**
- **Computer dependency**

➢ **Recovery and Mitigation Plan**

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Disaster Recovery

The chances of successful recovery (central government service):

- **Single site / multiple site**
- **Possibility of transfer of operations**
- **Computer dependency**
- **Internal organisation – especially speed of response**
- **Status of any outsourcing contract**
- **Quality of political leadership**
- ➢ **Recovery and Mitigation Plan**

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Business Continuity Planning

Most BCP is carried out in two stages:

- **vulnerability assessment**
  - ➔ **part of risk management process**
- **recovery plan**
  - ➔ **deciding what you actually will have to do**

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Shape of Disaster

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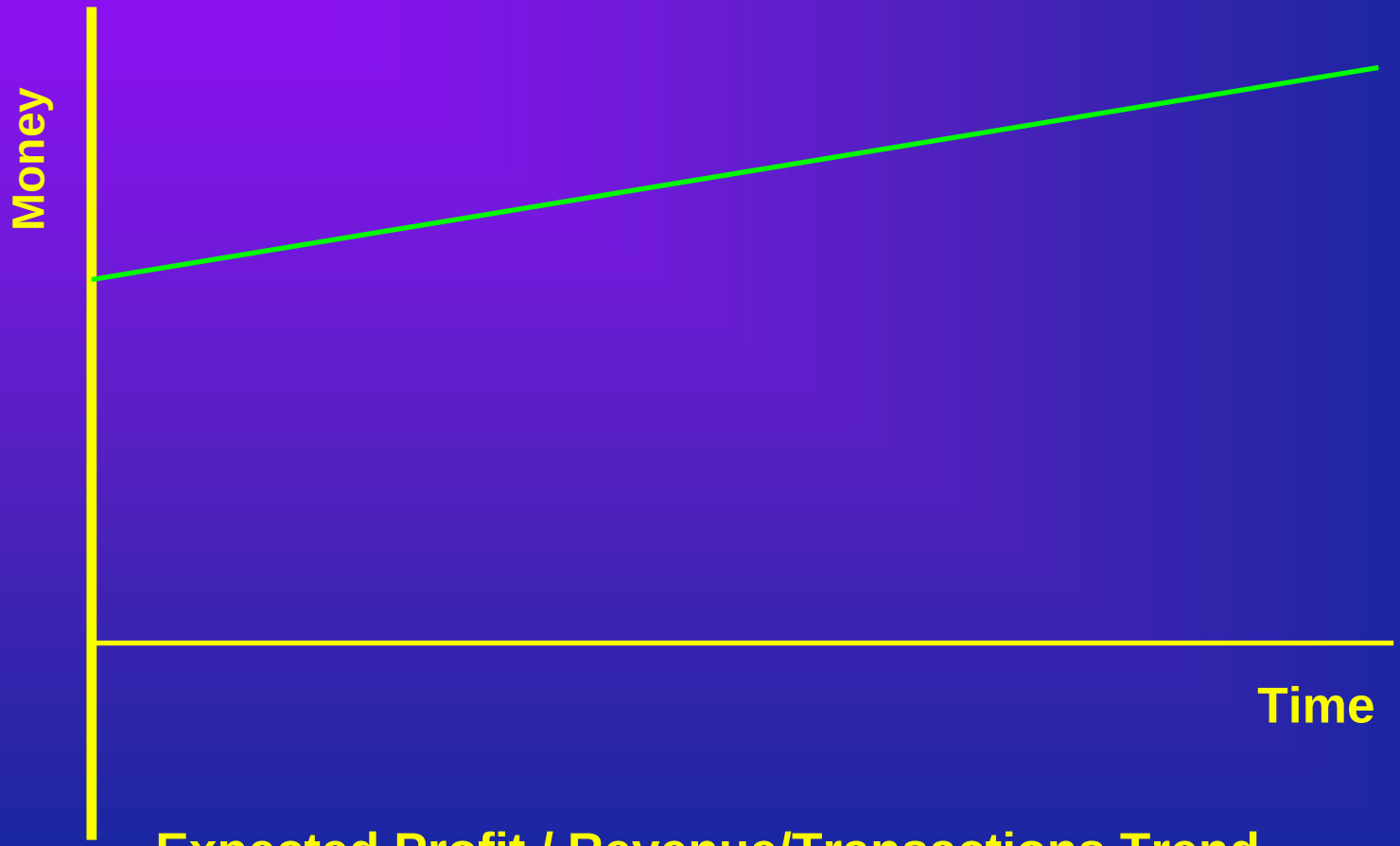
Shape of Disaster



Expected Profit / Revenue/Transactions Trend

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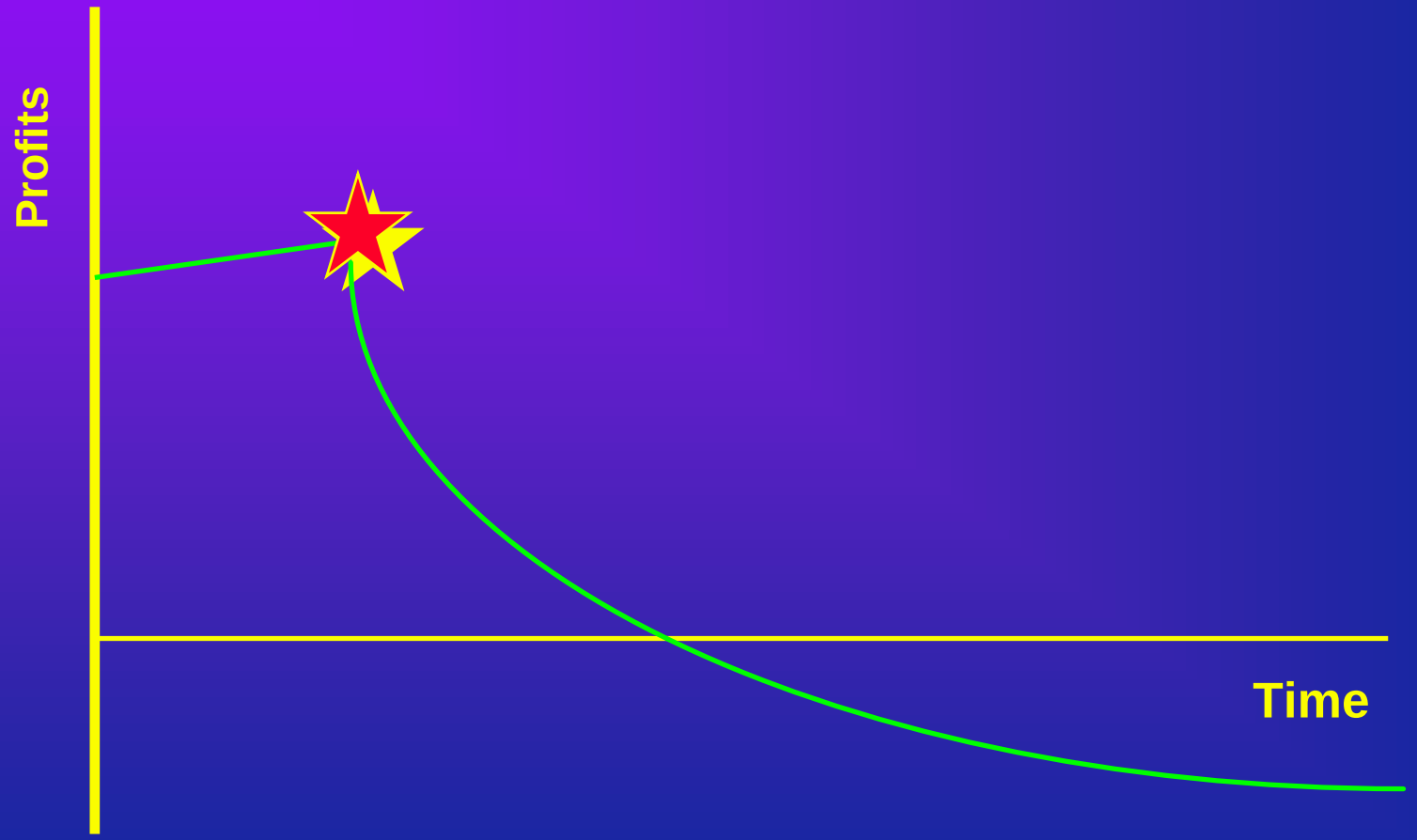

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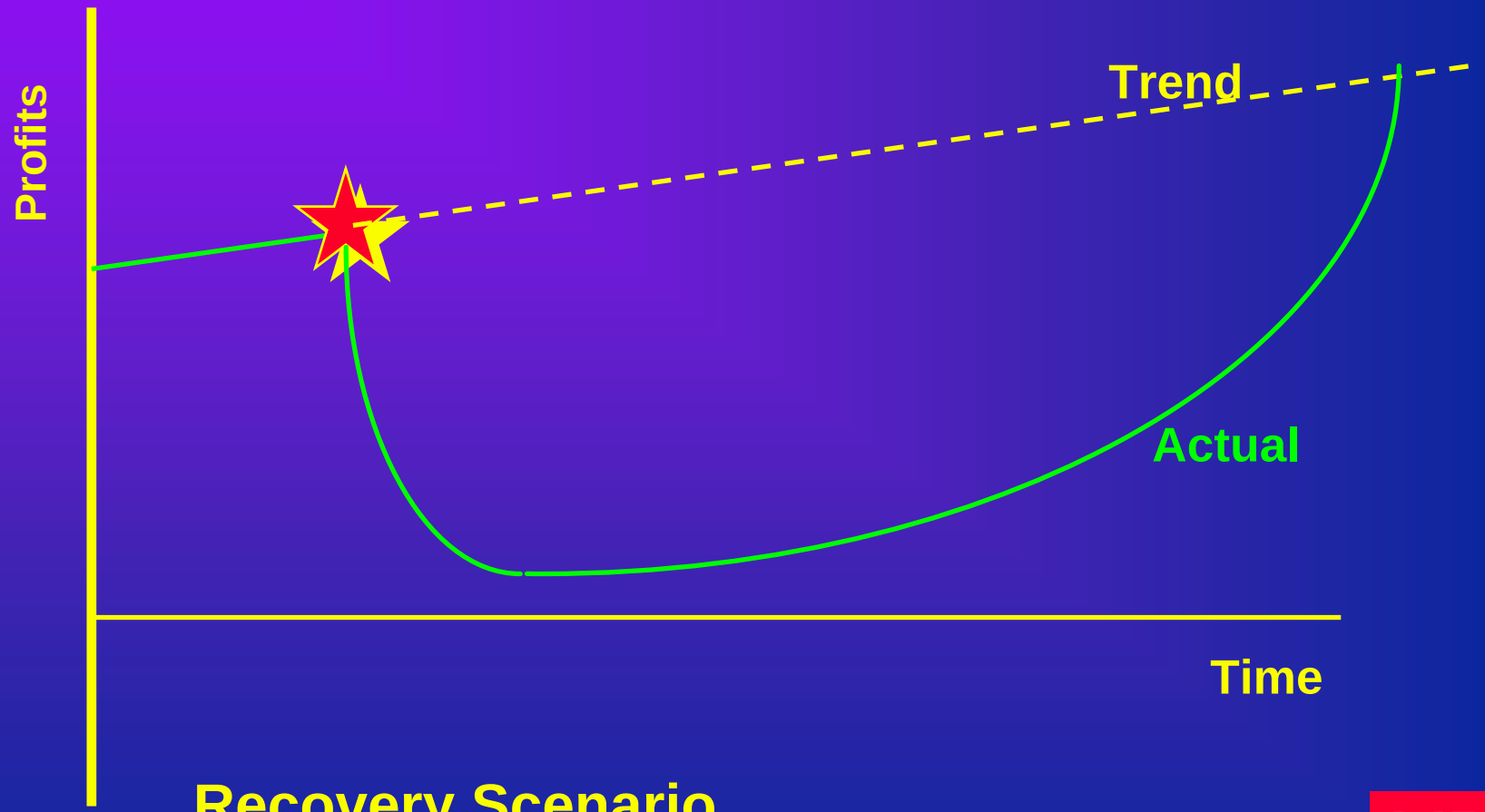

Recovery Scenario

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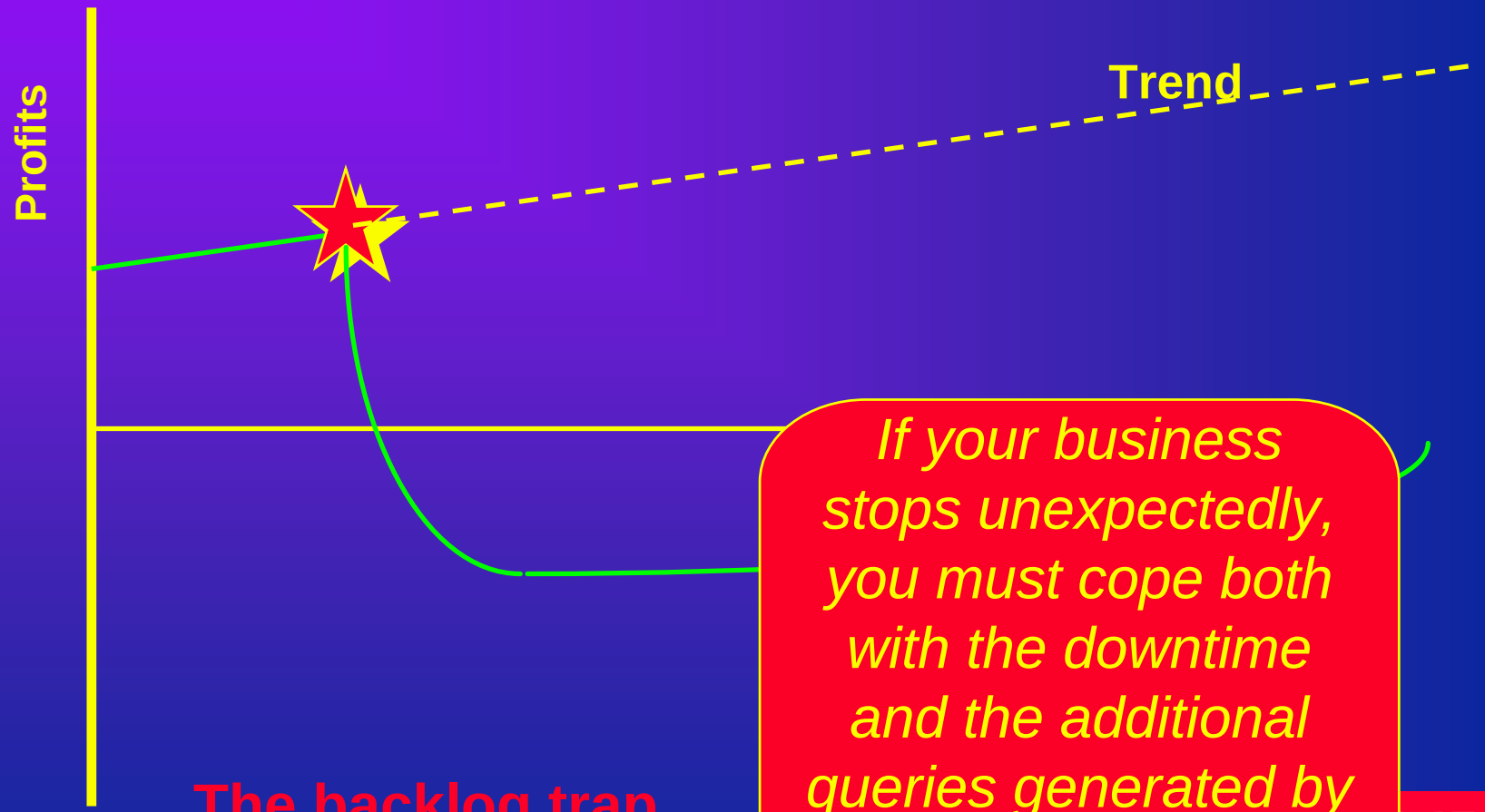

If your business stops unexpectedly, you must cope both with the downtime and the additional queries generated by the downtime

The backlog trap ……

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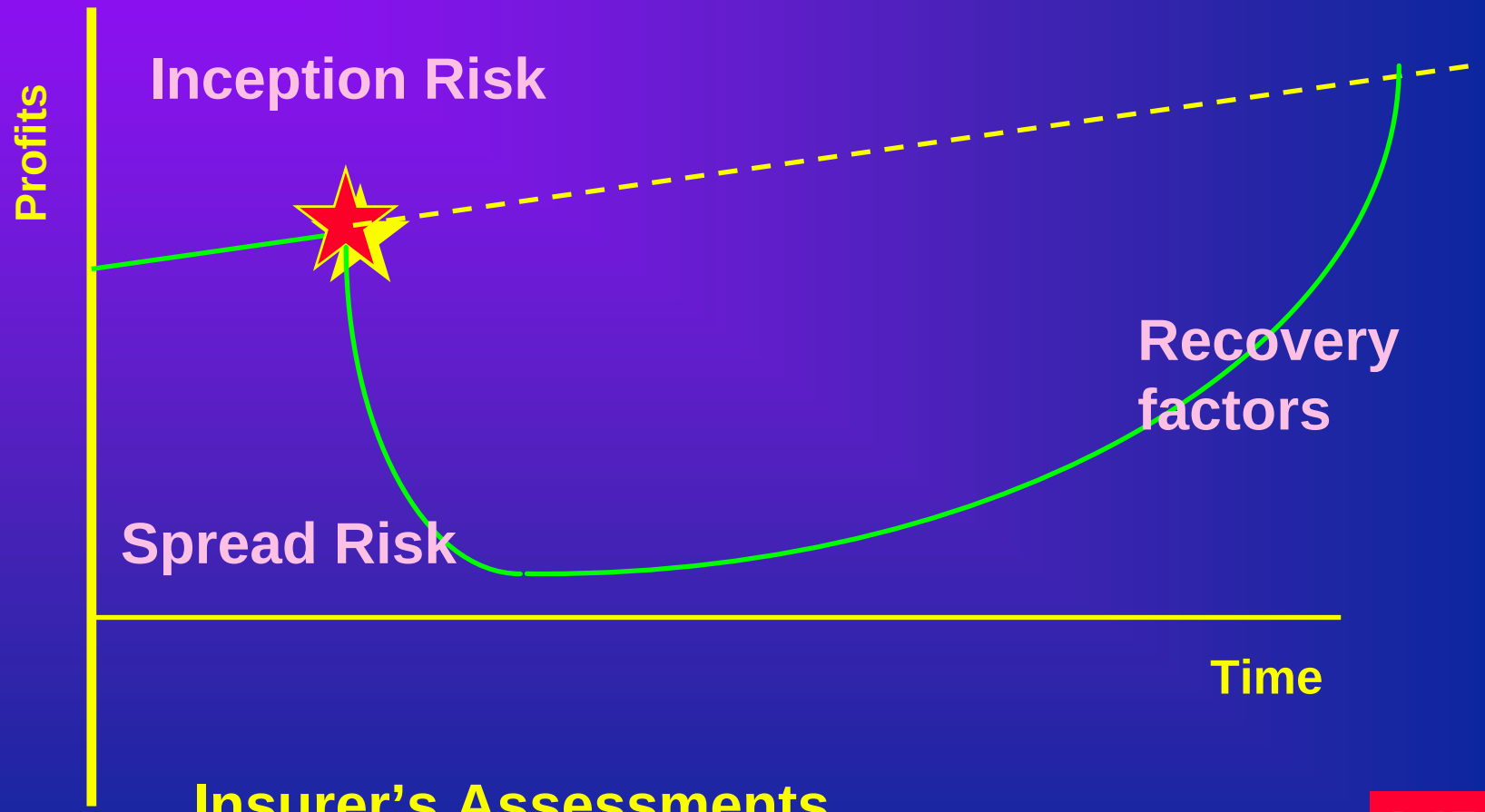

Insurer's Assessments..

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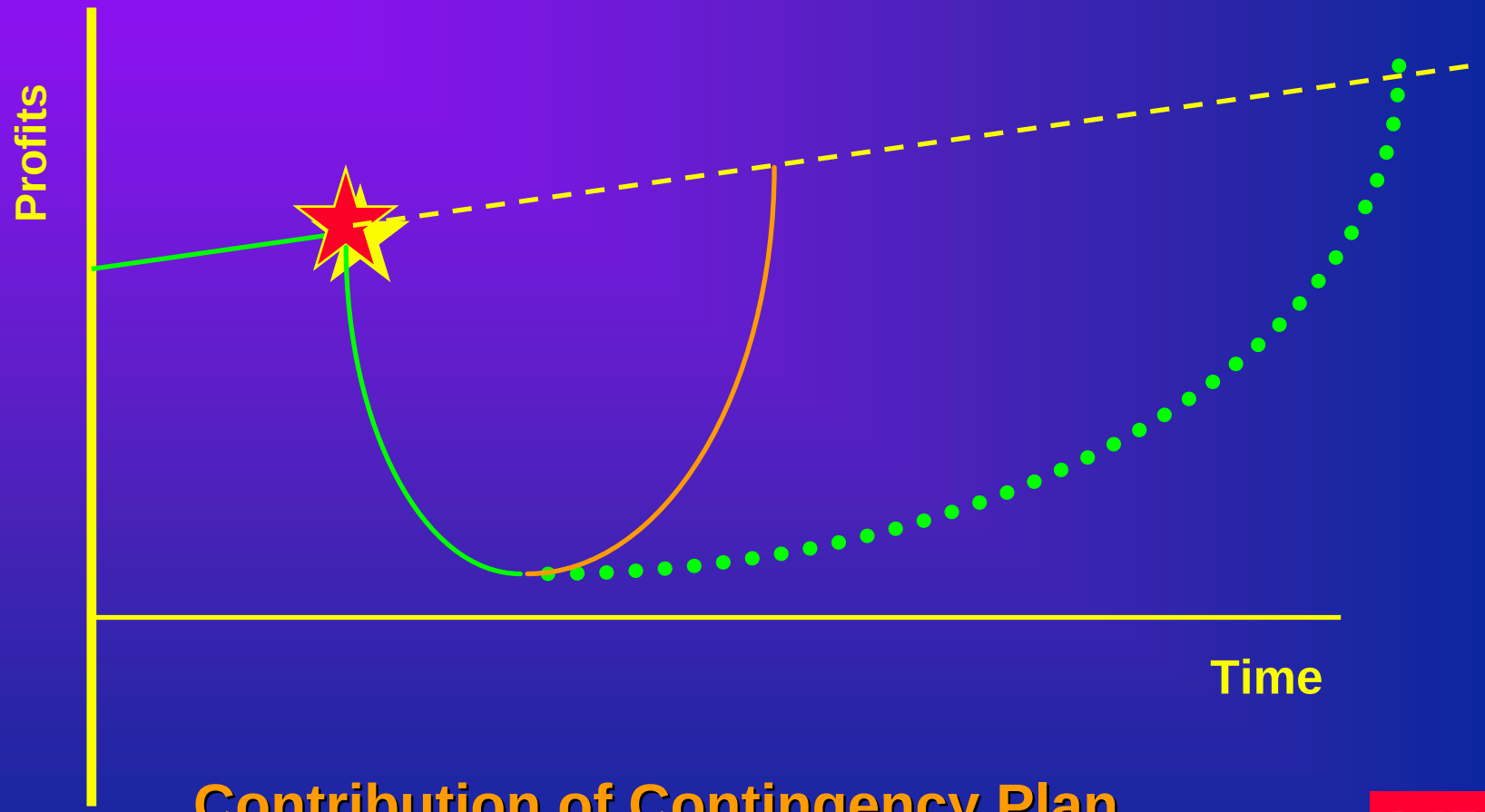

Contribution of Contingency Plan..

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What You Need to Know

- **Spread Risk**
  - → How might an initial event propagate and cascade?
- **Recovery Factors?**
  - → What is already available?
  - → What do you need to acquire / prepare for?

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Spread Risk

- Propagation and Cascade
- Historically cyber-events have not lasted very long:
  - ➔ Signatures of attacks, responses to zero-day vulnerabilities often found within a few days
  - ➔ The longer a botnet exists, the greater the chance the controller will be identified
- But each potential threat needs to be tested out for local circumstances

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Spread Risk: Propagation and Cascade

At the level of the nation state, you also need to think about:

- Impact on CII services
- Impact on very vulnerable people
- Impact on efficiency of emergency services
- Impact on politics / public confidence
- Acceptable levels of failure

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Recovery Factors

- You can't bring back a 100% service immediately – so what should you prioritise?
- What is already available that can be deployed?
  - ➔ Back-up data
- What do you need to acquire / prepare for?
  - ➔ Management structure
  - ➔ A Plan
  - ➔ Recovery Sites
  - ➔ Third Party facilities

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Business Continuity Planning

In order to save an organisation from extinction after a disaster...

- **We need to know how it operates**
  - ➔ **what are its essential functions?**
    - **operational**
    - **managerial**
  - ➔ **(commercial) where does its income come from?**
  - ➔ **(state) potential for social unrest**

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Business Continuity Planning

This is essentially a business and/or social science type analysis

- **(Commercial): immediate revenue generation and confidence building with customers, trading partners, staff, bankers, etc usually a priority over R&D and marketing**
- **(Nation State) Impact on very vulnerable people; impact on efficiency of emergency services; impact on politics / public confidence**

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Business Continuity Planning

- **We need a plan:**
  - → to identify priorities based on business need
  - → a dedicated team, distinct from the main management team
  - → detailed recovery procedures against likely disaster scenarios

Companies recover from disasters in complex, unexpected ways ...

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Business Continuity Planning

The chances of successful recovery:

- **the backlog trap**
- ***the return to normal from a "system down" takes 5 x the downtime period - if you are able to increase the effective wor immediately***

During recovery you must both recover and carry on normal activity – and deal with enquiries about "lost" work

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Business Continuity Planning

(Commercial) The chances of successful recovery:

- **the longer recovery takes the greater the chance of failure because of:**
  - ➔ **loss of staff motivation**
  - ➔ **customer defection**
  - ➔ **pressures on credit position**
    - **difficulty in getting credit from suppliers**
    - **difficulty in collecting debts**
    - **loss of bank confidence**

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Business Continuity Planning

(National State) The chances of successful recovery:

- **the longer recovery takes the greater the chance of failure because of:**
  - → **Loss of public confidence**
  - → **Leading to social unrest**

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Business Continuity Planning

- Total instant recovery implies a fully duplicated set of computer and network resources – plus instant mirroring
- Most people settle for less than that – you have to decide how much less is "acceptable"
- You can give different priorities to different parts of your organisation

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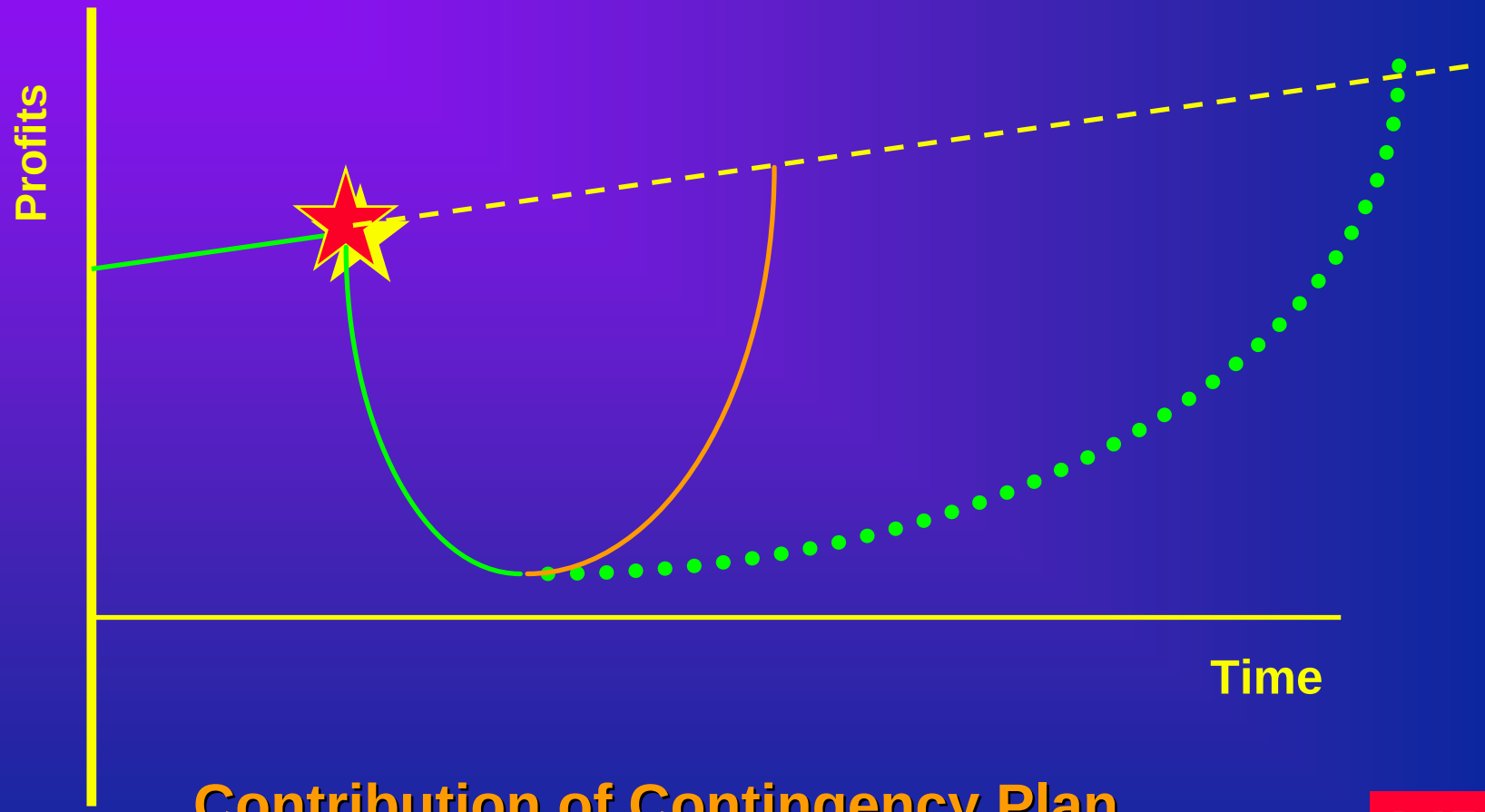
Shape of Disaster



Contribution of Contingency Plan..

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Shape of Recovery

Levels of Functionality by time

Within 2 hrs	10%
Within 24 hrs	25%
Within 7 days	50%
Within 3 months	90%

What you can achieve is a function of how much you spend, how wisely you spend, and the quality of your plan

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Managing the Recovery

- Dedicated team reporting to top management (top management need to concentrate on welfare of organisation as a whole, not the detail of recovery)
- IT, telecoms
- buildings facilities
- human resources
- legal
- press liaison

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Business Continuity Planning

Detailed recovery procedures against likely disaster scenarios

- **buildings**
- **equipment**
  - → **office**
  - → **computers**
  - → **telecoms**
  - → **machinery**
- **people**

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Disaster Recovery Facilities: what the market can offer

- Computer Resources
- Network Resources
- Resilient Web-servers
- (consultancy)

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Computer Disaster Facilities

- **Instant Restart**
  - ➔ Fully duplicated systems – very high costs
- **Hot restart**
  - ➔ (A few hours): Stand-by systems, updated configuration information plus up-to-date back-up, plus technical support
- **Warm restart**
  - ➔ (24-48 hours) Stand-by systems, may require specific configuration information plus up-to-date back-up
- **Cold restart**
  - ➔ (48 + hours) Stand-by system of agreed specification, but no pre-configuration; users responsible for the rest

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Computer Disaster Facilities

- **Hot restart**
- **Warm restart**
- **Cold restart**

These are based on the nation of facilities shared between a number of clients and in the hope that only one at a time will need them:

- ***Ratio of facilities to potential users***
- ***How does this fit in with your disaster scenario?***

If your system is very large or unusual you may not be able to get commercial standby facilities

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Network Recovery Facilities

- Dual Source / Routing supply
- Your own infrastructure facilities: switches, modems, telecommunications hubs etc: you need to have documents for potential emergency configurations – plans to operate from alternate premises
- Unless the network supplier is also hit by a catastrophe, purchasing additional capacity should be relatively easy
- If you are a very large customer you may need to make enquiries about “upstream” facilities

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Resilient Web-Servers

- **Problems:**
  - Likely attack is via DDoS / Botnets or poisoned addressing/routeing
  - If you change the IP address of uyour web-server, customers will not be able to find it. (Or when they do, so will the attackers)
- **Solutions:**
  - distributed computing platform for global Internet content and application delivery
  - Large system load-balancing

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Particular Problems for Nation States

- **Reliance on Out-sourcing**
  - → Failure of Government Service
  - → Overload of Government Information facility during a disaster
  - → What does contract say? What compensation for loss of service?
  - → If out-sourcer fails, can government tale over?
    - Contractual issues
    - Operational Practicalities

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Particular Problems for Nation States

- How to manage?
- Legal bases / authority
- Is this a job for the military or civilian parts of government?
- How, and how far, is political control exercised?
  - ➔ Political, democratic accountability
- How is this to be funded?

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Particular Problems for Nation States

- **Public Private Partnerships**
  - ➔ Much of the CII / CNI is in private ownership but provides services the public rely on
  - ➔ How far can a Government require a CII/CNI business to plan to serve a broad public safety agenda – as opposed to protecting revenue/profit?
  - ➔ Who pays for any additional costs involved?

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International Contingency Plans

- Most “international” work relates to law enforcement – CoE Cybercrime Treaty
- Almost nothing is being done on international contingency plans – any required action would be completely ad hoc
  - ➔ Many countries have yet to determine their own cybersecurity and cyber contingency plan strategies

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Finally

- Contingency Plans are essential because
  - ➔ some attacks will succeed
  - ➔ You will not know who is attacking and you cannot therefore deter by threat of retaliation
- The chances of successful recovery have no connection with your vulnerability to being hit
- You need to understand the spread risk – the extent to which an initial event may propagate
- You need to prioritise what you want to recover and at what speed
- You need a great deal of pre-planning
- You need a separate team to execute the plan

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